MYNAH℠

Danload 6000 Driver
Programmable Serial Interface Card
Series 2

USER MANUAL

Rev. P1.55

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1 INTRODUCTION

1.1 Scope

This document is the User Manual for the Danload 6000 driver firmware for the Emerson Process Management (EPM) DeltaV Control System; it provides information required to install, configure, and maintain the driver firmware on the DeltaV Series 2 Programmable Serial Interface Card (PSIC). The reader should be familiar with EPM's DeltaV PSIC and connected Danload 6000 devices.

The section *Document Format* briefly describes the contents of each section of this manual. *System Specifications* outlines hardware and software requirements for the Danload 6000 Driver (P1.55) firmware. This driver is not available for Series 1 serial cards.

1.2 Document Format

This document is organized as follows:

Table 1

Introduction	Describes the scope and purpose of this document.
Theory of Operation	Provides a general functional overview of the Danload 6000 Driver.
Downloading Firmware	Describes downloading procedures for the Danload 6000 Driver firmware on to the DeltaV PSIC.
Configuration Information	Describes procedures and guidelines for configuring the DeltaV PSIC.
Operational Check	Provides tips and assistance to ensure PSIC is properly setup and configured.
DeltaV–Field Device Electrical Interface	Describes the electrical interface between DeltaV and the Danload 6000 device. Also describes the cable pin assignments for RS-232 and RS-422/485 communications.
Technical Support	Describes who to call if you need assistance.
Example	Describes how to configure a device with input and output datasets.

1.3 System Specifications

The following table lists the minimum system requirements for the Danload 6000 Driver:

Table 2

Firmware	Danload 6000 Driver Firmware (P1.55)
Protocol Compatibility	Danload 6000 Communications Specification, Part Number: 3-9000-674, Rev 2.1, September 1998.
Software Requirements	DeltaV System Software (Release 6.3.2 or later) installed on a hardware-appropriate Windows NT or later workstation configured as a ProfessionalPlus for DeltaV Serial Interface Port License (VE4102)
Minimum DeltaV Hardware Requirements	FRSI DeltaV Serial Interface Series 2, Hardware PN: 12P2506X022 FRSI DeltaV M3, M5, MD or Series 2 MD Controller, Power Supply and 2 wide controller carrier FRSI 8 wide I/O card carrier

1.4 Revision History

Rev	Release Date	Revised By	Checked By	Description
1.11	4/04	WJK	NFW	Initial Release
1.55	4/09	NFW	NFW	Update to use driver toolkit v3.01

2 THEORY OF OPERATION

The Programmable Serial Interface Card (PSIC) has 2 ports which can be configured for RS-232, RS-422/RS-485 Half Duplex or RS-422/RS-485 Full Duplex communications with external devices. For communications with the Danload 6000 devices, any mode may be used.

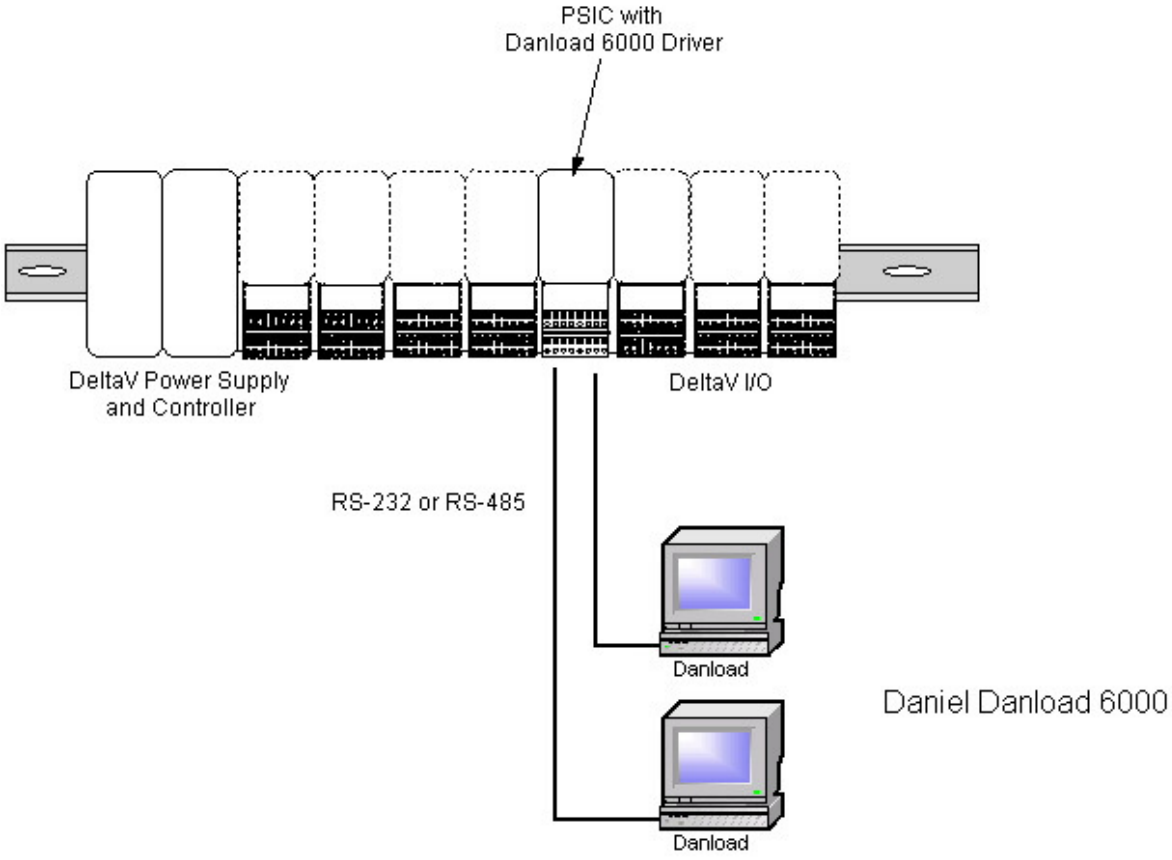
The DeltaV Serial Card Driver functionality will be as follows.

1. The driver will be flashed into the PSIC.

2. The driver will run in Master mode only and be responsible for sending commands to the Danload units. The Danload units will respond with batch/meter information, which will be reported to DeltaV in dataset registers.

3. The two ports of the PSIC work independently, each connected to a single Danload unit.

The following shows PSIC connectivity with Danload 6000 devices.

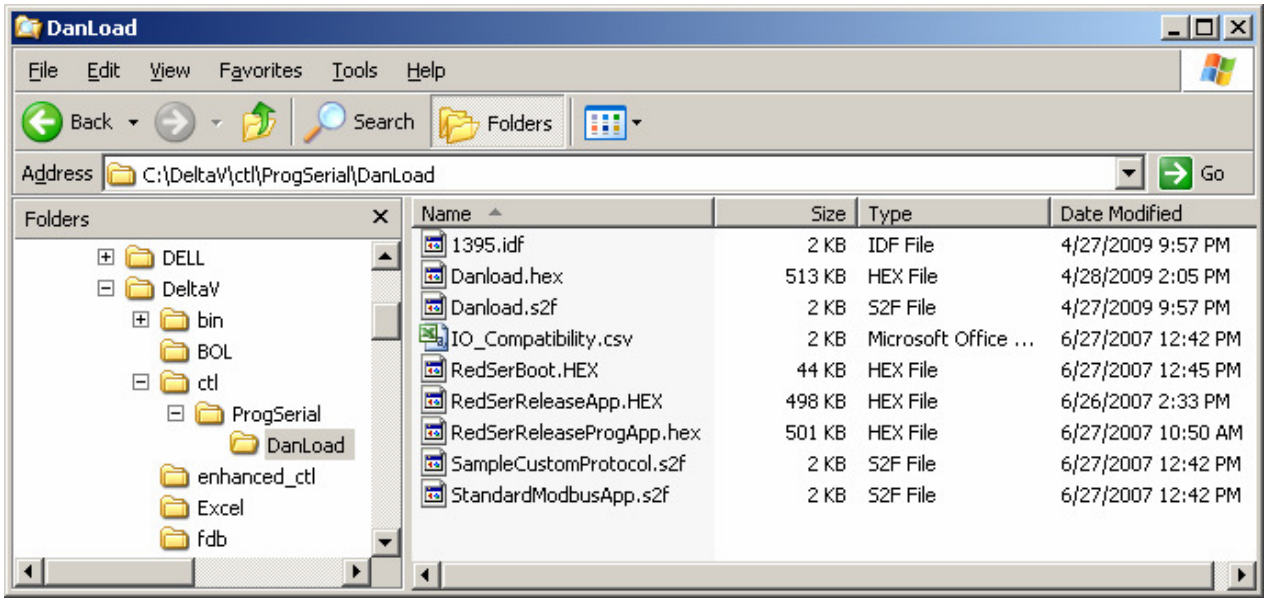


3 Downloading the firmware

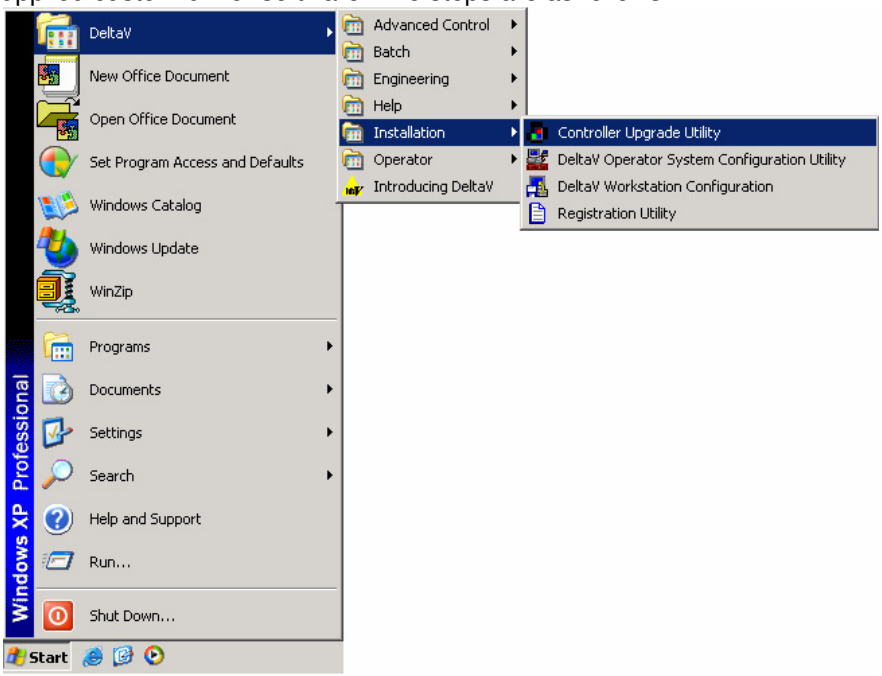
The driver software distribution comprises 9 files, distributed on a CD. These files must be copied to the DeltaV directory on your ProPlus Workstation. The path is:

\DeltaV\ctl\ProgSerial\Danload

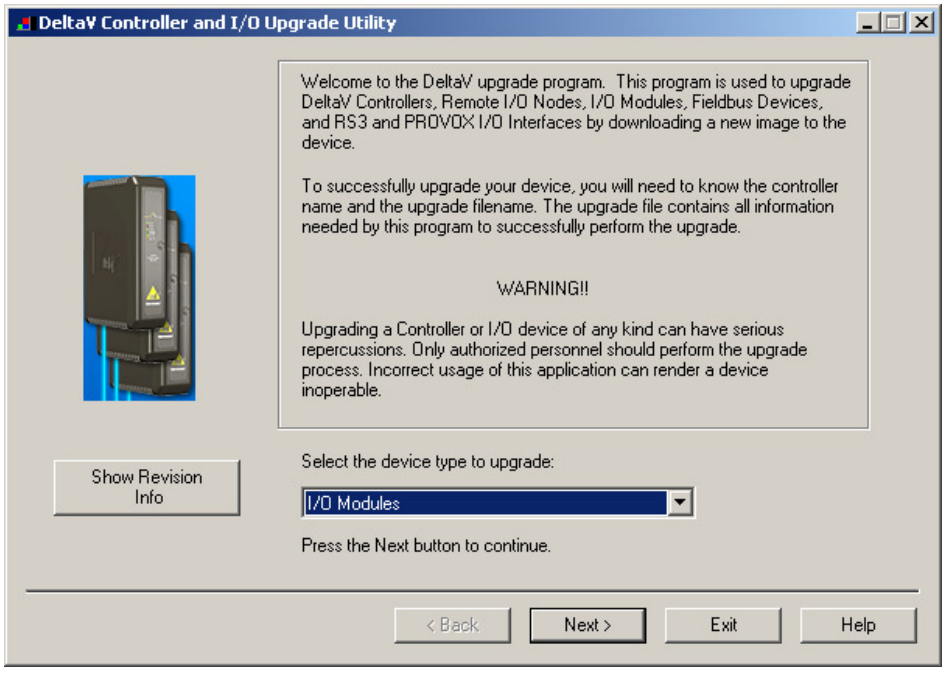
Note that you will have to create the \Danload subdirectory. The following files will be copied:



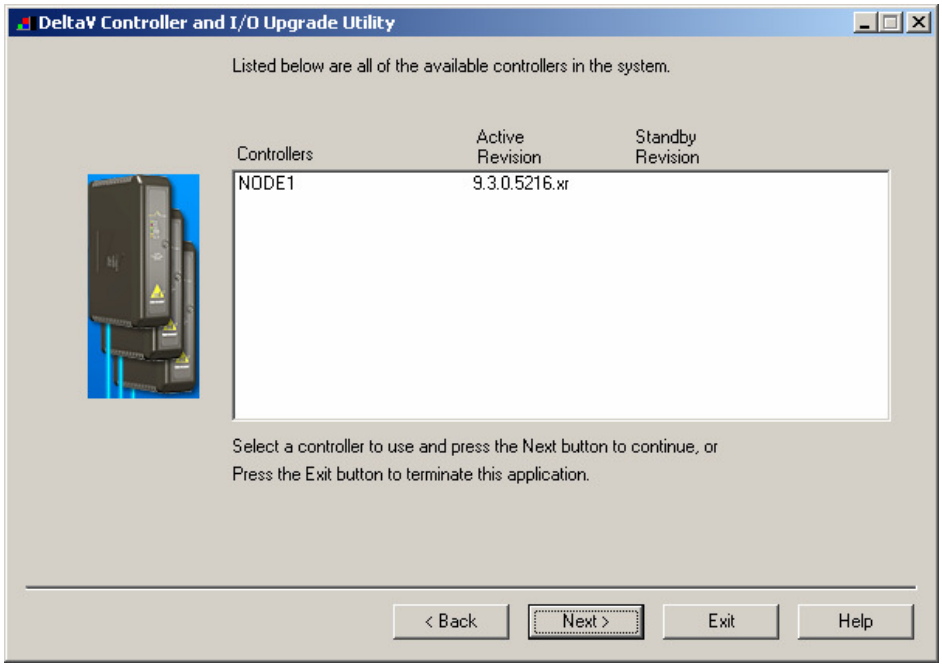
After copy completion, you are ready to program (or upgrade) the Programmable Serial Card with the supplied custom driver software. The steps are as follows:



1. Click on the Start button and select DeltaV-> Installation-> Controller Upgrade Utility as shown below, and the following dialog will appear:

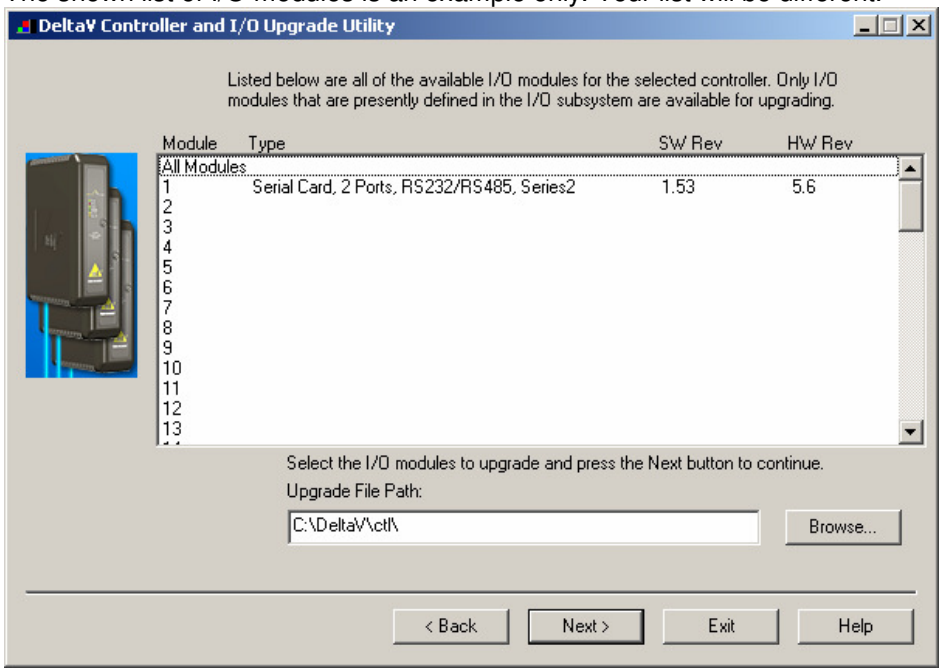


2. Choose Upgrade I/O Modules from the drop down menu and click Next.

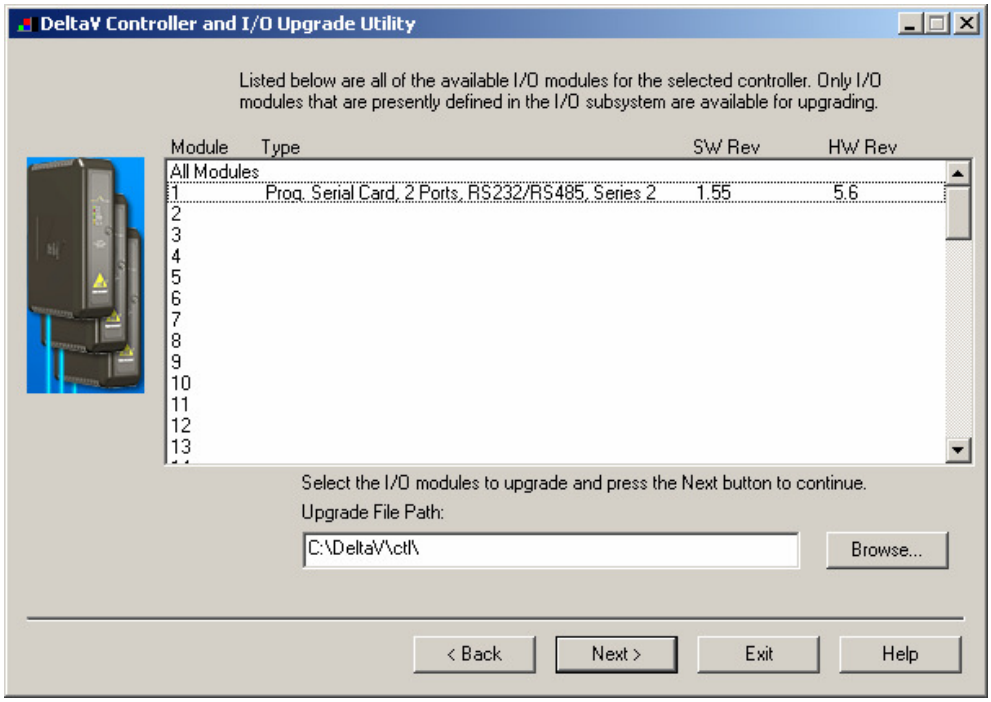


3. The above dialog will appear, listing all the available Controllers in your network. From this dialog, select the appropriate Controller and then Click Next.

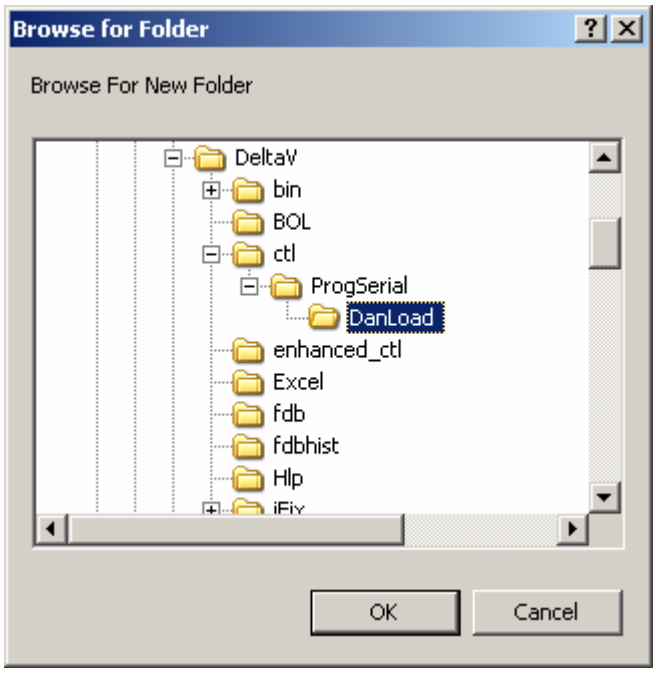
4. The following dialog will appear, listing all the I/O modules in your selected Controller. The shown list of I/O modules is an example only. Your list will be different.



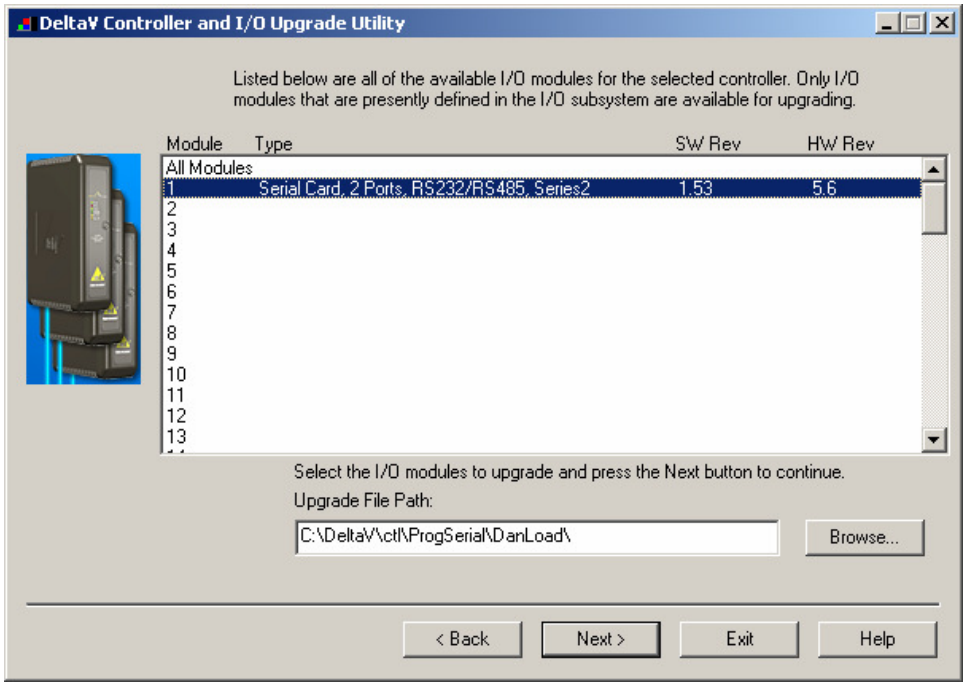
Note: Click the Browse button to select the location of the driver files. The first time a standard Serial card is upgraded to the Danload 6000 Driver, the dialog will be as shown below. When upgrading an existing Programmable Serial Card, skip Steps 4, 5 and 6, and go to Step 7.



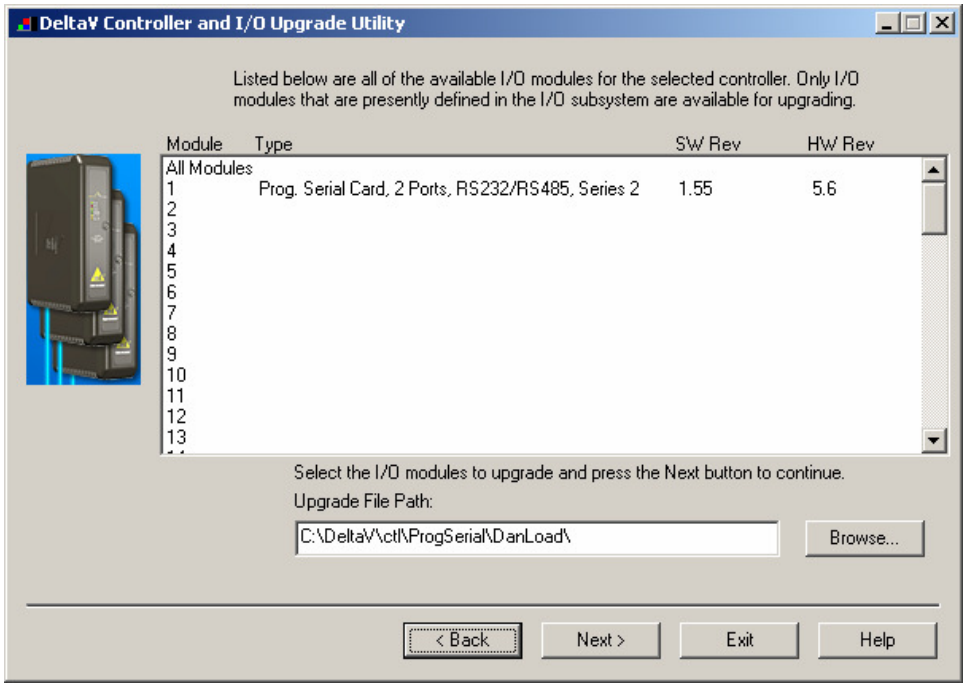
5. Click the Browse button and select the DeltaV path as shown below, and then click Ok. Note that the disk drive could be C or D.



6. Select the I/O module again as shown below and then click Next. Go to Step 9.



7. If you are upgrading an existing Programmable Serial Card, the dialog will be as shown below. From this dialog, select the Programmable Serial Card I/O Module in the list.



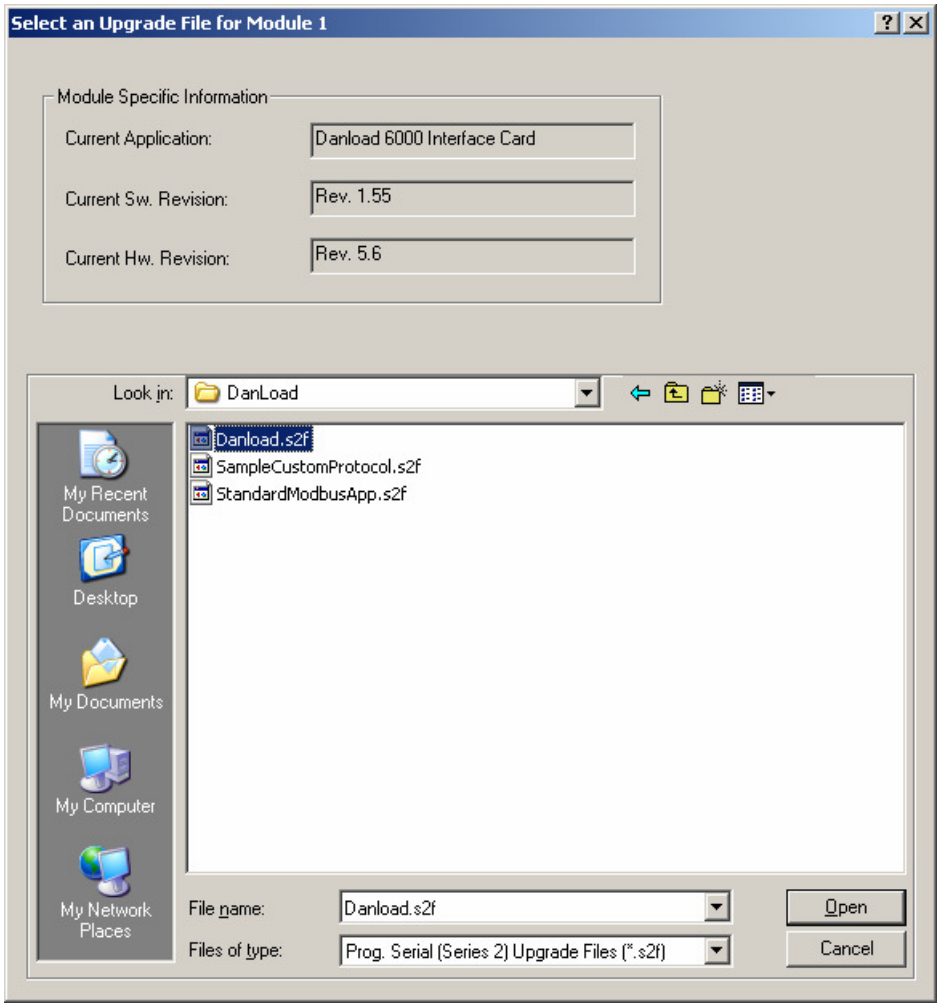
For example, we will select I/O Module 1. This will give you a dialog, from which you will select the file path to where the driver software is located. This path will be:

\DeltaV\ctl\ProgSerial \Danload

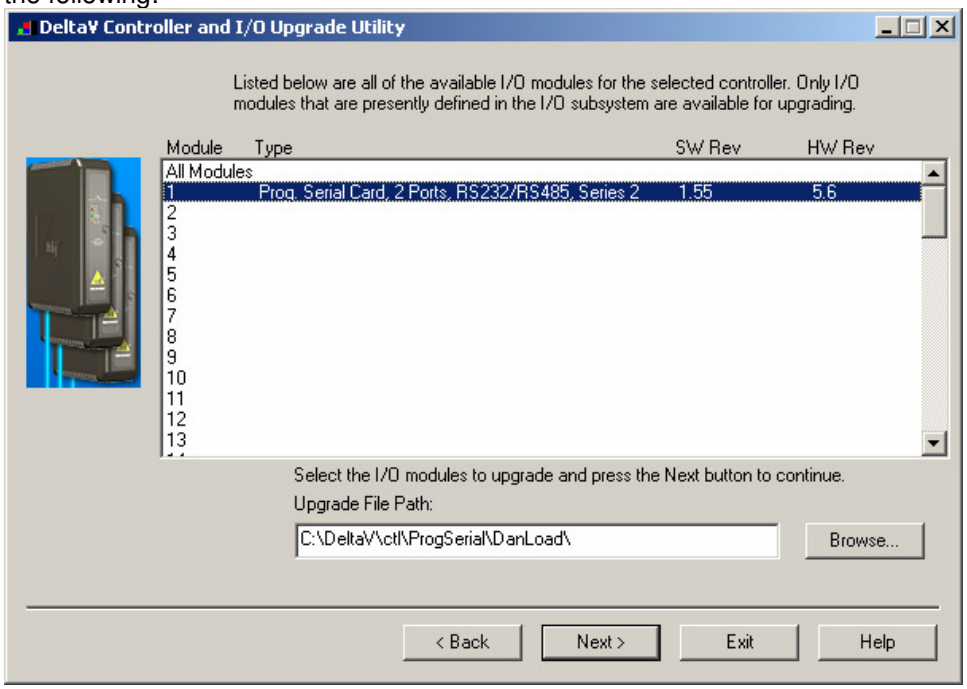
Once you are in the specified directory, you will need to select the following file:

Danload.S2F

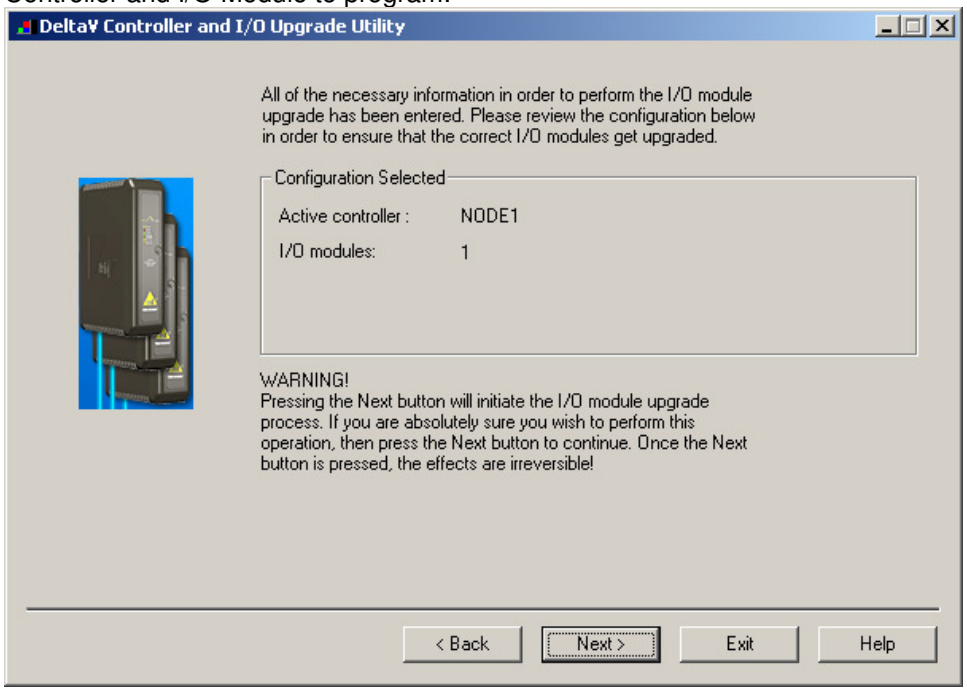
This is shown in the following dialog.



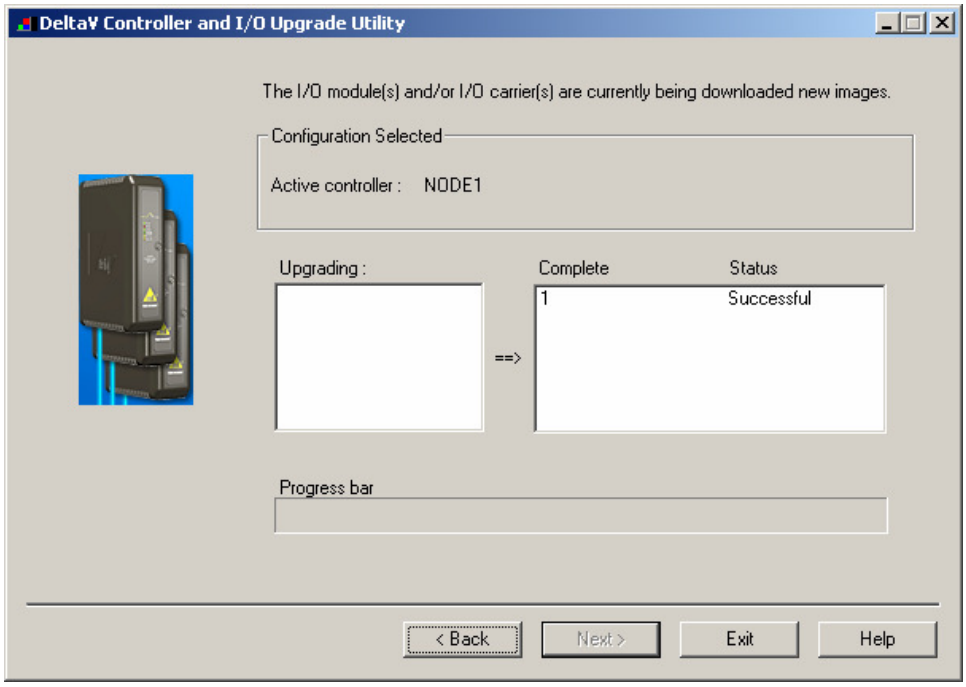
8. After selecting the .S2F file, Click on Open. This dialog will close and you will be back to the following:



9. In this dialog, Click Next again. You will get the following dialog, confirming the Controller and I/O Module to program.



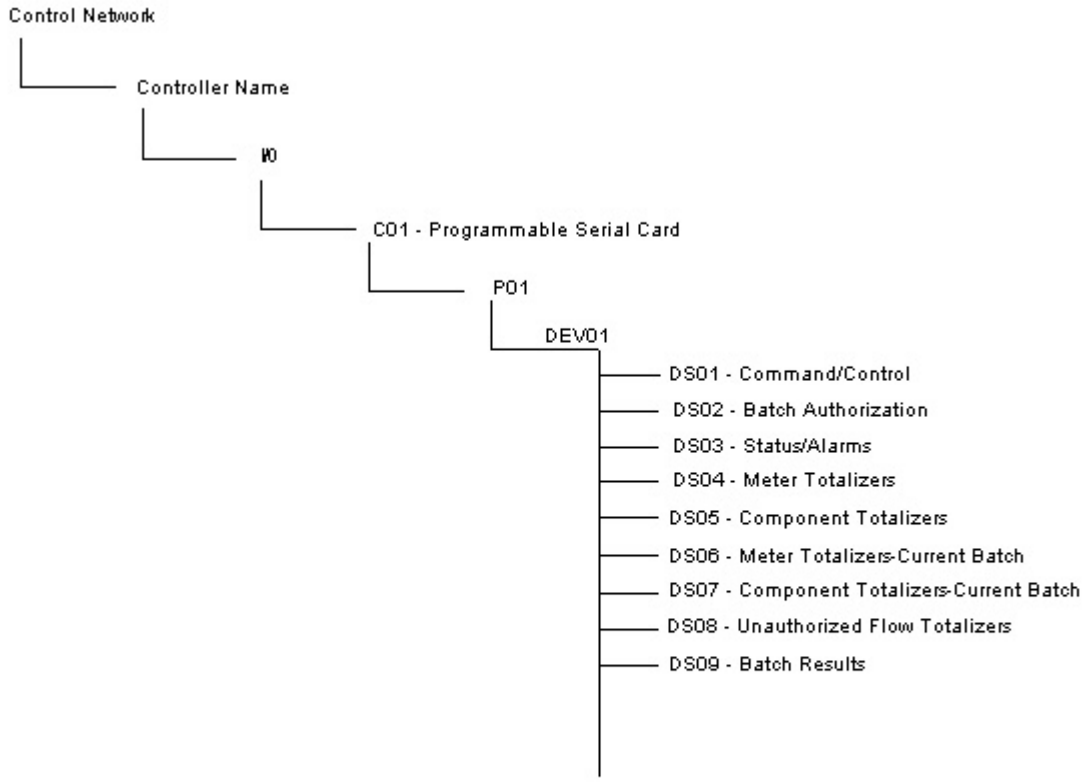
10. Click Next and the I/O Module upgrade process will begin. After completion, you will receive the following dialog, indicating success.



11. This completes the I/O Module upgrade process.

4 CONFIGURATION INFORMATION

The DeltaV Explorer view of a configuration containing a Programmable Serial Card will be as follows, where C1 has a card type of Programmable Serial Card, P01 and P02 are the ports on the card, DEVXX are pseudo devices attached to the ports, and DSXX are configured Datasets for each device.



Specifically, each port PXX will be configured with up to 1 device, e.g., DEV01. Each device will be configured with up to 16 datasets, DS01 – DS16 as shown below. Datasets 1-9 have a fixed configuration and must be configured as follows, while 10-16 are user definable.

Dataset Configuration
Table 3

Port	Devices	Dataset	Mode	Type and Number of Values	Description
P01					
	DEV01				
		DS01	Output	8-bit Unsigned Int, 10 Values	Command and Control Dataset
		DS02	Output	32-bit Unsigned int, 50 Values	Batch authorization parameters
		DS03	Input	32-bit Unsigned int, 50 Values	Status and alarm Registers
		DS04	Input	32-bit Unsigned Int, 50 Values	Meter Totalizers
		DS05	Input	32-bit Unsigned int, 50 Values	Component Totalizers
		DS06	Input	32-bit Unsigned Int, 50 Values	Meter Totalizer for Current Batch
		DS07	Input	32-bit Unsigned Int, 50 Values	Component Totalizer for Current Batch
		DS08	Input	32-bit Unsigned Int, 50 Values	Unauthorized Flow Totalizers
		DS09	Input	32-bit Unsigned Int	Batch Results
		DS10	Input	32-bit Unsigned Int	User Defined
		DS11	Input	32-bit Unsigned Int	User Defined
		DS12	Input	32-bit Unsigned Int	User Defined
		DS13	Input	32-bit Unsigned Int	User Defined
		DS14	Input	32-bit Unsigned Int	User Defined
		DS15	Input	32-bit Unsigned Int	User Defined
		DS16	Input	32-bit Unsigned Int	User Defined

Register assignments for datasets are defined as follows:

Command and Control Dataset
Table 4

Register	Description
R1	Command Number Register • 1 – Authorize Batch • 2 – Start Batch • 3 – End Batch • 4 – Change Operating Mode • 5 – Reset Unit
R2	Send Command • 0=no command • 1=send command
R3	Execution Status • 0=Command in Progress • 1=Command Completed
R4	Error Code • 0=No Error
R5	Report Alarm
R6	Clear Alarm • The operator can clear any Alarm Bit 0-79. Note that these bits are 0-based. To clear Alarm bit 0, enter the value 1. Similarly, to clear Alarm 79, enter the value 80.
R7	Clear Status • The operator can clear only Status Bits 3-8, 11-15, 19, and 22. Note that these bits are 0-based. To clear Status bit 3, enter the value 4.

Batch Authorization Parameters Dataset
Table 5

Register	Description
R1	Preset Volume
R2	Number of Configured Components
R3	Timeout for pressing Start Button
R4+n	Component n: Use or Do not use backup Gravity/Density
R5+n	Component n: Gravity/Density
R6+n	Component n: Use of Do not use backup Temperature
R7+n	Component n: Temperature

The index n=0-3, i.e., maximum of 4 components. Registers must be filled in before sending the Authorize Batch command. Registers 20-50 are not used.

Status and Alarm Dataset
Table 6

Register	Description
R1	32 Status Bits
R2	Swing Arm side
R3	Batch Gross Volume Whole units
R4	Batch Net Volume or Mass/Weight Whole units
R5	Safety Circuits Status
R6	Alarm code for oldest active primary alarm
R7	Alarm Bits 79-72
R8	Alarm Bits 71-64
R9	Alarm Bits 63-56
R10	Alarm Bits 55-48
R11	Alarm Bits 47-40
R12	Alarm Bits 39-32
R13	Alarm Bits 31-24
R14	Alarm Bits 23-16
R15	Alarm Bits 15-8
R16	Alarm Bits 7-0

Status Bits (1 Based)
Table 6.1

Status Bit	Description
1	Operating mode is manual
2	Primary alarm
3	Passcode entry in progress
4	Operation timed out
5	Recipe selected
6	Additives selected
7	Preset volume entered
8	Keypad data available
9	Program code values changed
10	Transaction in progress
11	Batch in progress
12	Key pressed
13	Transaction ended
14	Batch ended
15	Batch aborted
16	Intermediate level input alarm stopped batch
17	RESERVED
18	Batch authorized
19	Transaction authorized
20	Transaction end request
21	Keypad and display locked out to automation system
22	Batch Stopped
23	Program mode
24	Flowing (Batch in progress and not stopped)
25-32	RESERVED

Alarm Bits (1 Based)
Table 6.2

Alarm Bit	Description
1	Primary Display Failure
2	Secondary Display Failure
3	Comms Failure Channel A
4	Comms Failure Channel B
5	Unable To Maintain Blend
6	Flow Rate Too Low Meter 1
7	Flow Rate Too Low Meter 2
8	Flow Rate Too Low Meter 3
9	Flow Rate Too Low Meter 4
10	Flow Rate Too High Meter 1
11	Flow Rate Too High Meter 2
12	Flow Rate Too High Meter 3
13	Flow Rate Too High Meter 4
14	Valve Closed Early Meter 1
15	Valve Closed Early Meter 2
16	Valve Closed Early Meter 3
17	Valve Closed Early Meter 4
18	Time-out – No Flow Detected Meter 1
19	Time-out – No Flow Detected Meter 2
20	Time-out – No Flow Detected Meter 3
21	Time-out – No Flow Detected Meter 4
22	Unauthorized Flow Exceeds Limit Meter 1
23	Unauthorized Flow Exceeds Limit Meter 2
24	Unauthorized Flow Exceeds Limit Meter 3
25	Unauthorized Flow Exceeds Limit Meter 4
26	Pulse Security Error Meter 1
27	Pulse Security Error Meter 2
28	Pulse Security Error Meter 3
29	Pulse Security Error Meter 4
30	Temperature Failure Meter 1
31	Temperature Failure Meter 2
32	Temperature Failure Meter 3
33	Temperature Failure Meter 4
34	Pressure Failure Meter 1
35	Pressure Failure Meter 2
36	Pressure Failure Meter 3
37	Pressure Failure Meter 4
38	Unable To Close Valve Meter 1
39	Unable To Close Valve Meter 2
40	Unable To Close Valve Meter 3
41	Unable To Close Valve Meter 4
42	Density Failure Component 1
43	Density Failure Component 2
44	Density Failure Component 3
45	Density Failure Component 4
46	Component 1 Block Valve Not Closed
47	Component 2 Block Valve Not Closed

Table 6.2 continued on next page.

Alarm Bits (1 Based)
Table 6.2 – *Continued from previous page*

48	Component 3 Block Valve Not Closed
49	Component 4 Block Valve Not Closed
50	Additive 1 Failure
51	Additive 2 Failure
52	Additive 3 Failure
53	Additive 4 Failure
54	Additive 5 Failure
55	Additive 6 Failure
56	Safety Circuit 1
57	Safety Circuit 2
58	Safety Circuit 3
59	Safety Circuit 4
60	Safety Circuit 5
61	Safety Circuit 6
62	Safety Circuit 7
63	Safety Circuit 8
64	Data Logging Memory Full
65	Memory Check Failure
66	Storage Memory Full
67	Power Failure
68	Unable To Ramp Down
69	MPMC 1 Failure
70	MPMC 2 Failure
71	Calibration Failure Meter 1
72	Calibration Failure Meter 2
73	Calibration Failure Meter 3
74	Calibration Failure Meter 4
75	Intermediate Level Input
76	Reserved
77	Reserved
78	Reserved
79	Reserved
80	Reserved

Meter Totalizers Dataset
Table 7

Register	Description
R1	Meter 1: Gross Totalizer Rolls
R2	Meter 1: Net Volume or Mass/Weight Totalizer Rolls
R3	Meter 2: Gross Totalizer Rolls
R4	Meter 2: Net Volume or Mass/Weight Totalizer Rolls
…	…
Rn	Meter n: Gross Totalizer Rolls
Rn+1	Meter n: Net Volume or Mass/Weight Totalizer Rolls

Component Totalizers Dataset
Table 8

Register	Description
R1	Component 1: Gross Totalizer Rolls
R2	Component 1: Net Volume or Mass/Weight Totalizer Rolls
R3	Component 2: Gross Totalizer Rolls
R4	Component 2: Net Volume or Mass/Weight Totalizer Rolls
…	…
Rn	Component n: Gross Totalizer Rolls
Rn+1	Component n: Net Volume or Mass/Weight Totalizer Rolls

Meter Totalizers for Current Batch Dataset
Table 9

Register	Description
R1	Meter 1: Current Batch Gross Totalizer Rolls
R2	Meter 1: Current Batch Gross Mass/Weight Totalizer Rolls
R3	Meter 2: Current Batch Gross Totalizer Rolls
R4	Meter 2: Current Batch Gross Mass/Weight Totalizer Rolls
…	…
Rn	Meter n: Current Batch Gross Totalizer Rolls
Rn+1	Meter n: Current Batch Gross Mass/Weight Totalizer Rolls

Component Totalizers for Current Batch Dataset
Table 10

Register	Description
R1	Component 1: Current Batch Gross Totalizer Rolls
R2	Component 1: Current Batch Gross Mass/Weight Totalizer Rolls
R3	Component 2: Current Batch Gross Totalizer Rolls
R4	Component 2: Current Batch Gross Mass/Weight Totalizer Rolls
…	…
Rn	Component n: Current Batch Gross Totalizer Rolls
Rn+1	Component n: Current Batch Gross Mass/Weight Totalizer Rolls

Unauthorized Flow Totalizers Dataset
Table 11

Register	Description
R1	Meter 1: Gross Flow 10th Rolls
R2	Meter 1: Gross Net Volume or Mass/Weight 10th Rolls
R3	Meter 2: Gross Flow 10th Rolls
R4	Meter 2: Gross Net Volume or Mass/Weight 10th Rolls
…	…
Rn	Meter n: Gross Flow 10th Rolls
Rn+1	Meter n: Gross Net Volume or Mass/Weight 10th Rolls

Batch Results Dataset
Table 12

Register	Description
R1	Low 16-bits - Batch Sequence Number High 16-bits – Transaction Sequence Number
R2	Low 16-bits – Recipe Number High 16-bits – Swing Arm Side
R3	Start Year/Day/Month/Hour (8-bits each)
R4	Start Minutes/Seconds
R5	End Year/Day/Month/Hour
R6	End Minutes/Seconds
R7	Meter 1 Gross Totalizer at Start of Match
R8	Meter 1 Gross Net Volume or Mass/Weight Totalizer at Start
R9	Meter 1 Gross Totalizer at end of Batch
R10	Meter 1 Gross Net Volume or Mass/Weight Totalizer at End
R11	Meter 2 Gross Totalizer at Start of Match
R12	Meter 2 Gross Net Volume or Mass/Weight Totalizer at Start
R13	Meter 2 Gross Totalizer at end of Batch
R14	Meter 2 Gross Net Volume or Mass/Weight Totalizer at End
R15	Meter 3 Gross Totalizer at Start of Match
R16	Meter 3 Gross Net Volume or Mass/Weight Totalizer at Start
R17	Meter 3 Gross Totalizer at end of Batch
R18	Meter 3 Gross Net Volume or Mass/Weight Totalizer at End
R19	Meter 4 Gross Totalizer at Start of Match
R20	Meter 4 Gross Net Volume or Mass/Weight Totalizer at Start
R21	Meter 4 Gross Totalizer at end of Batch
R22	Meter 4 Gross Net Volume or Mass/Weight Totalizer at End
R23	Component 1 Gross Batch Whole Units
R24	Component 1 Net Volume or Mass/Weight Nbatch Whole Units
R25	Component 1 Average Temperature
R26	Component 1 Average Density
R27	Component 1 Average Pressure
R28	Component 1 Actual % in Batch
…	… Component 2-4

Registers in this dataset are set to 0 when a batch starts, and remain at 0 until a batch has completed.

4.1 Port Configuration

First, enable the port. Then click on the Advanced Tab and Master mode. Slave is not supported. Specify the retry count, message timeout value in milliseconds, and message delay time. In most cases, you can leave these at their default values. Next, click on the Communications Tab and specify the Port type. The Port type will be RS-232. In general, RS-232 will be used for Danload communications, unless there are distance limitations. If the Danload is more than 50 feet from the PSIC, RS-485 should be used. Lastly, select the Baud rate, Parity, Data bits and Stop bits parameters; these must match the Danload settings.

4.2 Device Configuration

Specify devices, as shown above. There will be one device under each port.

4.3 Dataset Configuration

Datasets contain the Danload information, and must be configured as described in Table 3.

4.3.1 Data Direction:

The Data Direction for dataset 1 and 2 should always be defined as Output. All other datasets are Input.

4.3.2 Output Mode:

Output mode and Read back items are not used. These should be left as default.

4.3.3 DeltaV Data Type:

Dataset 1 will be configured as 8-bit unsigned int. All other datasets will be configured as type 32-bit Unsigned Int.

4.3.4 DeviceDataType

The following device data types are available:

Table 13

DeviceDataType	Description
0	Output Datasets (used for DS1 & DS2 only)
1	All Meter Totalizers
2	All Component Totalizers
3	All Addative Totalizers
4	All Unauthorized Flow Totalizers
5	Detailed Meter Values
6	Detailed Component Values
7	Read Inputs
8	Get Status & Alarms
9	Read Completed Batch Data
10	Read Meter Totalizers for Current Batch
11	Read Component Totalizers for Current Batch

4.3.5 Data Start Address and Number of Values

The Start Address for each dataset is not used and can be left as default 0. The Number of values for Dataset 1 is 10. For all other datasets, the number of values should be set to 50.

4.3.6 Special Data

The following device data types use special data registers to specify additional parameters required for reading from the Danload:

DeviceDataType	Special Data #
(5) Read Detailed Meter Values	Special Data 1: Meter # (1->4)
(6) Read Detailed Component Values	Special Data 1: Component # (1->4)
(7) Read Inputs	Special Data 1: Point Type
	Special Data 2: Point Number

4.4 Operating Procedure

4.4.1 Step 1 - Check Alarm and Status registers for errors and operating mode

- If error see manual for procedure
- If the operating mode is manual see Step 2 if not proceed to step 3.

4.4.2 Step 2 - Changing Operating Mode

When the Danload is in Manual Operating mode, DeltaV will be unable to authorize or start batch transfers. In order switch modes the user must follow these steps:

- Enter the Command Code for Change Operating mode into Dataset 1 Register 1.
- Enter a 1 into Dataset 1, Register 2 to execute the command.
- When the value in Dataset 1, Register 3 changes to a 0 then the command is being executed. When Register 3 returns to a 1 the command has been executed
- Check Register 4 for error code, if the value is 0 then the Danload has successfully changed operating modes.

4.4.3 Step 3 - Authorize Batch

- Enter the command code for Authorize Batch into Dataset 1, Register 1
- Fill in all the required registers for the Authorize Batch command in Dataset 2.
- Enter a 1 into Dataset 1, Register 2 to execute the command.
- When the value in Register 3 changes to a 0 then the command is being executed. When Register 3t returns to a 1 the command has been executed
- Check Register 4 for error code, if the value is 0 then the batch has been authorized. Also the Batch Authorized bit will now be flagged if the authorization was successful.
- You now must issue the start batch command before the timeout specified.

4.4.4 Step 4 - Start Batch

- Enter the command code for Start Batch into register 1
- Enter a 1 into register 2 to execute the command.

- When the value in register 3 changes to a 0 then the command is being executed. When the it returns to a 1 the command has been executed
- Check register 4 for error code, if the value is 0 then the batch has been started. Also the Batch in Progress bit will now be flagged if the command was successful.
- Once a batch has been started it will either run to completion, Stop on alarm, or stop when the Stop Batch command is sent.

4.4.4 **Step 5 -** Batch Has Completed

Run To Completion

- Once the Batch reaches completion the status bit "Batch Completed" will be flagged. This will cause DeltaV to issue the Get Batch data command and retrieve the results of the batch.

Stop on Alarm

- Alarm bits can be checked to see what alarm has occurred. The manual should be checked for the correct procedure to deal with the alarm. Once the alarm is resolved and if the batch is resumable the Start Batch command can be re-sent to resume the batch.

Stop Batch

- If the operator needs to stop a batch he/she can do so by sending the Stop Batch Command. Similar to the Start Batch Command the Stop Batch command is sent by loading the Stop Batch Command Code into Register 1 and sending the command by entering a 1 into register 2.
- Once the batch is stopped it can be resumed by sending the Start Batch Command Again.

4.4.5 **Step 6 -** Misc Commands

Reset Unit

- If the operator needs to reset the Danload 6000, the Reset Unit command can be sent by loading Register 1 with the Reset Unit Command code and loading a 1 into Register 2 to execute the command.
- The Danload will be power cycled and start in the last operating mode it was in.

Send Alarm

- If the operator wants to raise an alarm on the Danload, using Register 5 in Dataset 1 can do this. Simply enter the alarm code for the alarm you wish to be raised. The command will be sent and the alarm given will be raised.

Clear Alarm

- If this operator wished to clear an alarm on the Danload he/she can do so by loading the Alarm Code for the alarm they wish to clear into Register 6 of Dataset 1.
- Since the Alarm Codes are 0 based and our system is 1 based. Alarm Code 0 can be flagged and cleared by entering a value of 1.

Clear Status Bits

- Certain status Bits can be cleared by the operator if needed by using Register 7 in Dataset 1. This can be done by loading the Status Bit number you wish to clear into this register.
- The operator can clear only Status Bits 3-8, 11-15, 19, and 22.
- For example, enter value 4 to clear Status bit 3.

5 Operational Check

5.1 Scope

The following sections provide some assistance to ensure the interface is working properly.

5.2 Verify Hardware and Software Version Number

The user can verify that the HTG driver has been installed using the DeltaV Diagnostics tool. The Diagnostics tool will show the Hardware Revision No. (HwRev) and the Software Revision No. (SwRev).

To begin the DeltaV Diagnostic tool select Start-> DeltaV-> Operator-> Diagnostics. In the Diagnostics tool expand the Controller, I/O and then double click on the Programmable Serial Interface Card that has the driver installed.

The following information will be displayed:

:	:	:
HwRev	Hardware Revision	1.10 (or later)
SwRev	Software Revision	2.3 (or later)

5.3 Verify Configuration

- Verify port configuration: The serial port must be enabled. User needs to make sure communication settings such as baud rate, parity, and number of data bits match the field device settings.
- Verify dataset configuration: The datasets configured must be as shown above.

5.4 Verify I/O Communication With Control Studio

User can create I/O modules in the control studio to verify correct values are being written out. An example module is shipped with the distribution. This module shows methods for writing text to the datasets and also how to handle time.

5.5 Using Diagnostics

- Verify PSIC communication: Select the PSIC on Diagnostics and press the right mouse button. Select Display Real -Time Statistics from the drop down menu. If the Programmable Serial Interface Card is functioning then the user will see the Valid Responses counter and the Async and/or Sync Transactions counters incrementing. There will not be any error counting up.

- Verify port statistics: Select the Port on the Programmable Serial Interface Card and press the right mouse button. Then select Display Port Statistics form the drop down menu. Verify that the port communications statistics are being displayed properly and are counting as expected for the protocol's functionality.

- Verify dataset values: Select a dataset and press the right mouse button. Select View Dataset Registers from the Drop down window. Verify that the dataset values are displayed as expected.

5.6 LED Indication

The Yellow LED for the port should be on solid when all communications on that port are valid. The Yellow LED should be blinking if there is some valid communications and some communications with errors on that port. The Yellow LED should be OFF if there are no valid communications on that port.

6 DeltaV–Field Device Electrical Interface

The electrical interface between DeltaV and field devices conforms to the RS-232 and RS-422/485 standards.

Each PSIC has 2 ports, which function independently. The distance between the serial card and the field device can be as much as 5000 feet, per the RS-422/485 standard. When using RS-232, the distance is limited to 50 feet. Section 6.1 shows the pin assignments for the PSIC serial terminal block.

6.1 Pin Assignments for DeltaV PSIC

RS-232 Standard

Terminal Number	Signal Description
1	Port 1 - Isolated Ground (GND)
2	Unused
3	Port 1 – Transmit Data (TxD)
4	Unused
5	Port 1 – Receive Data (RxD)
6	Unused
7	Port 1 – Data Terminal Ready (DTR)
8	Port 1 – Data Set Ready (DSR)
9	Port 2 - Isolated Ground (GND)
10	Unused
11	Port 2 – Transmit Data (TxD)
12	Unused
13	Port 2 – Receive Data (RxD)
14	Unused
15	Port 2 – Data Terminal Ready (DTR)
16	Port 1 – Data Set Ready (DSR)

RS-422/485 Half Duplex Standard

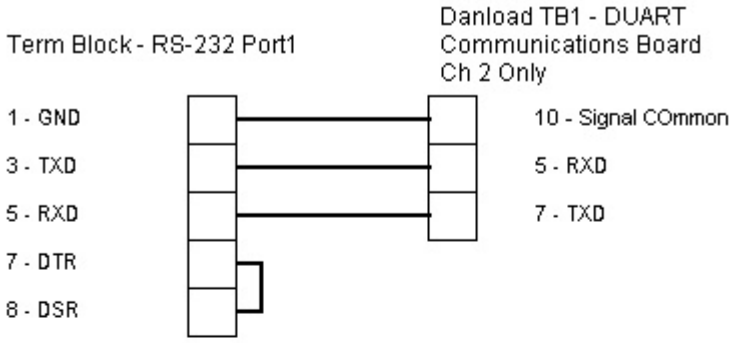
Terminal Number	Signal Description
1	Port 1 – Isolated Ground (GND)
2	Port 1 - Data +
3	Unused
4	Port 1 - Data -
5	Unused
6	Unused
7	Unused
8	Unused
9	Port 2 – Isolated Ground (GND)
10	Port 2 – Data +
11	Unused
12	Port 2 - Data -
13	Unused
14	Unused
15	Unused
16	Unused

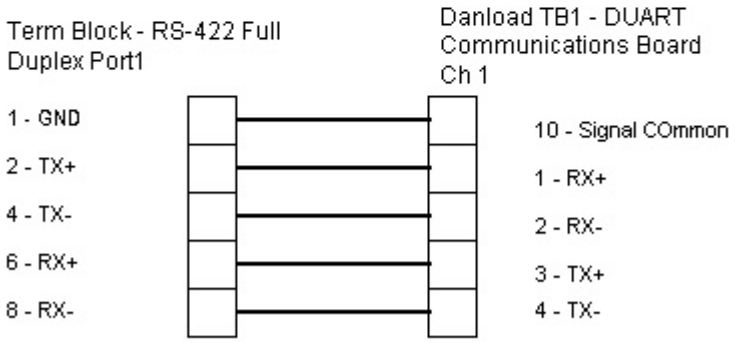
RS-422/485 Full Duplex Standard

Terminal Number	Signal Description
1	Port 1 – Isolated Ground (GND)
2	Port 1 – TxD +
3	Unused
4	Port 1 – TxD -
5	Unused
6	Port 1 – RxD +
7	Unused
8	Port 1 – RxD -
9	Port 2 – Isolated Ground (GND)
10	Port 2 – TxD +
11	Unused
12	Port 2 – TxD -
13	Unused
14	Port 2 – RxD +
15	Unused
16	Port 2 – RxD -

6.2 Wiring Connections

In general, the figure below shows the connections between the Field Device and the PSIC termination block. For additional DeltaV cabling information, please refer to the DeltaV Books Online documentation. Foe Danload cabling/jumper information, refer to Daniel Field Wiring CPU & DUART Communications Boards Drawing # CE-12693 Rev B, and Field Wiring CPU Version 2, Drawing # BE-19712, Rev P1.





7 Technical Support

For technical support or to report a defect, please give Mynah Technologies a call at (636) 681-1555. If a defect is discovered, please document it in as much detail as possible and then fax your report to us at (636) 681-1660.

You can also send us your questions via e-mail. Our address is:

support@mynah.com

Thank you for using DeltaV.